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09/107,684	06/30/1998	STEVEN M. BLUMENAU	E0295/7040-R	8390

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EXAMINER

CHOI, WOO H

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 04/15/2004

32

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/107,684

Applicant(s)

BLUMENAU ET AL.

Examiner

Woo H. Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 January 2004.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 and 32-49 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-30, 32-49 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 – 30, and 32 – 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Napolitano *et al.* (US Patent No. 6,219,693, hereinafter “Napolitano”) in view of Starek *et al.* (US Patent No. 5,991,778, hereinafter “Starek”).

3. With respect to claims 1, 10 – 12, 21 – 22, and 27, Napolitano discloses a storage system (Figure 2C, controller 228 and Figures 3 and 4, file array adapter 350 and associated disk drives 325) and for use in a computer system including a host computer, the storage system comprising:

at least one storage device having a plurality of user-accessible storage locations, the at least one storage device including at least one disk drive (325);

a cache memory (adapter cache 375, see also Figure 4, cache manager 454); and

a controller (228), coupled to the cache memory and the at least one storage device, that controls access to the at least one storage device from the host computer, the controller writing data to at least two non-contiguous user-accessible storage locations on the at least one storage device in response to a communication from the host computer, without writing data to at least one user-accessible storage location disposed between the at least two non-contiguous storage

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locations so that any data in the at least one user-accessible storage location is preserved (See Figures 4 and 5, the controller contains a server file system and interacts with a host at a file level through a client. See also, col. 8 lines 14 – 16, adapter is a file system controller. Figure 10 shows striping and mirroring. A write operation on a striped or mirrored logical volume involves at least two non-contiguous storage locations and other locations between the target locations are not affected).

However, Napolitano does not specifically disclose that the data written to the locations is generated by the controller and is independent of any data passed from the host computer. On the other hand, Starek discloses a system for writing data generated that is independent of any data passed from the host computer (Starek, See col. 5, lines 27 – 47, a file deletion is done by overwriting the file with any desired user defined or predefined pattern which is generated independently of any data passed from the host).

It would have been obvious to one of ordinary skill in the art, having the teachings of Napolitano and Starek before him at the time the invention was made, to use the secure file deletion teachings of the storage system of Starek in the storage system of Napolitano, in order to ensure that the data deleted is not retrievable to reduce security risk that is unacceptable to may individuals and public and private organizations (Starek, col. 1, lines 23 – 27).

4. Claims 1 – 30 and 32 – 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Napolitano *et al.* (US Patent No. 6,219,693, hereinafter “Napolitatno”) in view of Starek *et al.*

(US Patent No. 5,991,778, hereinafter “Starek”) further in view of Wong *et al.* (US Patent No. 5,832,525, hereinafter “Wong”).

5. With respect to claims 1, 10 – 12, 21 – 22 and 27, and Napolitano and Starek disclose all of the limitations of claim 1, as disclosed above. In addition to Napolitano’s disclosure of writing to at least two non-contiguous storage location, Wong discloses that it is common for a file to not reside contiguously on disk (Wong, col. 6, lines 59 – 61). Therefore, from Wong’s disclosure one skilled in the art can infer that writing to at least two non-contiguous locations when writing a file to a disk is a common occurrence.

It would have been obvious to one of ordinary skill in the art, having the teachings of Napolitano, Starek, and Wong before him at the time the invention was made, to use disk fragmentation teachings of the storage system of Wong in the storage system of Napolitano’s storage system as enhance with Starek’s teachings, in order to maximize I/O performance and increase the number of available clusters while reducing the disk fragmentation for more efficient use of storage space (Wong, col. 7, lines 10 – 17).

6. With respect to claim 28, Napolitao discloses the acts of:

mapping the logical object to at least one storage location of the plurality of storage locations on the at least one storage device that is assigned to store the information for the logical object (Figures 3 and 4, files are mapped to disk drives 325 through the file array file system 410. Files are also mapped to host cache. See figure 5);

receiving, at the storage system, a communication from the host computer identifying the at least one storage location (col.11, lines 54 – 59); and

generating, within the storage system, data that is independent of any data passed from the host computer to the storage system and writing the generated data to the at least one storage location in response to the act of receiving the communication (See rejections of claim 1 above in paragraphs 3 and 5).

7. With respect to claims 2 and 13, the controller is capable of generating the data that is independent of any data passed from the host computer to the storage system and writing the generated data to the at least two non-contiguous user-accessible storage locations in response to a single command (The secure file deletion discussed above requires a single delete command).

8. With respect to claims 3, 14 and 49, the controller is capable of generating the data that is independent of any data passed from the host computer to the storage system having a predetermined state and writing the generated data having the predetermined state to each of the at least two non-contiguous user-accessible storage locations in response to the single command (As discussed above in reference to claim 1, the generated data is predefined).

9. With respect to claim 4, 15 and 33 – 48, the at least one storage device includes a plurality of disk drives (Napolitano, 325), wherein the at least two non-contiguous user-accessible storage locations are perceived by the host computer to be non-contiguous storage locations on different disk drives (Napolitano, figure 10), and wherein the controller is capable of

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writing the generated data to each of the at least two non-contiguous user-accessible storage locations in response to a single command.

10. With respect to claim 5, 16, 23, 24, 25 and 26, the controller is capable of writing the generated data to only each of the at least two non-contiguous user-accessible storage locations in response to the single command (File deletion only affect the area occupied by the deleted file).

11. With respect to claim 6, 17, the at least one storage device includes a plurality of disk drives, wherein the at least two non-contiguous user accessible storage locations are on different disk drives (Napolitano, Figure 10), and wherein the controller is capable of writing the generated data to each of the at least two non-contiguous user-accessible storage locations in response to the single command (See rejections of claims 1 and 2).

12. With respect to claim 8, 19, the at least two non-contiguous user-accessible storage locations correspond to a logical object defined by the computer system, and wherein the controller is capable of writing the generated data to each user-accessible storage location corresponding to the logical object in response to the single command (The storage locations correspond to a file which is a logical object defined by the computer system).

13. With respect to claim 9, 20, the controller is capable of generating the data that is independent of any data passed from the host computer to the storage system having a

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predetermined state and writing the generated data having the predetermined state to each user-accessible storage location corresponding to the logical object in response to the single command (See rejections of claims 1, 2, and 3 above).

14. With respect to claims 29, 30, 32, the host computer includes at least one mapping layer, and wherein the act of mapping includes an act of mapping the logical object through the at least one mapping layer on the host computer to the at least one storage location on the at least one storage device, wherein the at least one mapping layer includes a plurality of mapping layers including at least one of a file system mapping layer, a logical volume mapping layer, and a database mapping layer, and wherein the act of mapping includes an act of mapping the logical object through at least one of the file system mapping layer, the logical volume mapping layer, and the database mapping layer on the host computer to the at least one storage location on the at least one storage device (Napolitano, figure 4, see also discussion of figure 4 in col. 6, line 65 – col. 8, line 42)

16. With respect to claims 7 and 18, the single command separately identifies the at least two non-contiguous user-accessible storage locations (MS-DOS supports multiple file deletion with a Delete single command. Napolitano, Starek, and Wong all support MS-DOS and Windows family of operating system, all of which support MS-DOS Delete command).

17. Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Napolitano and Starek as applied to claims 1 and 12, and also over Napolitano, Starek, and



Wong as applied to claims 1 and 12 as discussed above, and further in view of the MS-DOS command (MS-DOS User's Reference, Microsoft Corporation, 1987, pp. 56).

The Napolitano/Starek and Napolitano/Starek/Wong combinations do not explicitly describe a single command separately identifying two storage locations. On the other hand, as explained in the MS-DOS User's Reference, the MS-DOS delete command could be used to delete "more than one file at a time" by allowing for multiple files to be specified for deletion via a single command.

It would have been obvious to one of ordinary skill in the art, having the teachings of Napolitano, Starek, Wong, and Microsoft before him at the time the invention was made, to use the multiple file deletion with a single teachings of Microsoft in the system of Napolitano and Starek and in the system of Napolitano, Starek and Wong, in order to be able to delete multiple files with a single delete command to make the delete command more flexible and easier to use and also so that the operating system supported by the system is compatible with the Microsoft versions of the DOS/Windows family of Operating Systems.

#### ***Response to Arguments***

18. Applicant's arguments filed on January 22, 2004 have been fully considered but they are not persuasive.

19. *Allegation of improper combination of Napolitano and Starek*

Applicant's first argument, that the combination of Napolitano and Starek is improper, is not persuasive. Contrary to Applicant's assertion that there is no motivation to combine, the motivation is clearly stated in the rejection and comes directly from Starek. Starek recognizes that operating systems such as WINDOWS and many other applications leave traces of deleted files on the hard drive or other storage device (see Starek col. 1, lines 10 – 25). According to Starek, this poses a security risk to many individuals and organizations. Starek's invention reduces this security risk as Applicant admits. Applicant seems to suggest that Starek's invention can only be used in a PC and therefore cannot be used in a computer system of type disclosed in Napolitano. This is merely an allegation and not a logical conclusion that is supported by any factual evidence or a well reasoned argument. In addition, contrary to Applicant's allegation, Starek specifically discloses that the invention "can be implemented, for example, by a software driver within the file system established by the operation system of a personal computer, computer workstation or other computer devices" (col. 3, lines 2 – 5). There's no teaching in either one of the references that precludes the combination of the two teachings.

20. Applicant's assertion, that incorporating the secure delete functionality of Starek into the storage system of Napolitano would not be successful, is not supported by any factual evidence or well reasoned logical argument that is persuasive. Applicant has not shown that the "vendor-supplied driver must reside on the host computer" as alleged. In fact, in figure 3, Starek shows that the vendor supplied driver (i.e. driver supplied by a third-party developer under WINDOWS operating system, such as, for example, the developer of Napolitano's storage system as

modified by Starek's teaching) resides below the installable file system (IFS) manager in the hierarchy, closer to the actual physical storage device than the file system software. In addition, Napolitano implements a WINDOWS IFS in a storage system replacing the WINDOWS I/O system (figure 4, col. 6, lines 37 – 64). There is no requirement that the vendor supplied driver reside in the host computer as Applicant alleges. Starek's figure 3 and Napolitano's figure 4 along with their discussions in the respective disclosures would make it obvious to one skilled in the art that the logical place for a lower level vendor specific driver would be the file adapter 350 of Napolitano where the both the file system and the actual I/O subsystem for the physical devices reside.

21. Patentability of Claims

Applicant's argument regarding the combination and the location of the vendor supplied driver is addressed above. As stated in the rejections above, a system for writing data generated that is independent of any data passed from the host computer is disclosed by Starek.

22. As to Applicant's argument regarding the limitation "writing the generated data to at least two non-contiguous user-accessible storage locations on the at least one storage device in response to a communication from the host device", the rejection cites figure 10 of Napolitano's disclosure. It also clearly states that the write operation on a striped or mirrored logical volume involves at least two non-contiguous storage locations without affecting other locations between the target locations.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Woo H. Choi whose telephone number is (703) 305-3845. The examiner can normally be reached on M-F, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on (703) 305-3821. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*1566 / whc*

whc  
April 13, 2004



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